May 4, 2020

Submitted via e-docket

U.S. Environmental Protection Agency
Docket Center (EPA/DC), (28221T)
1200 Pennsylvania Ave., NW
Washington, DC 20460-0001

Attention: Matthew Khan – Clothianidin Chemical Review Manager

Subject: EPA–HQ–OPP–2017–0750; FRL–10004–38 85 FR 5953 - Pesticide Registration Review; Proposed Interim Decisions for Several Neonicotinoid Pesticides; Notice of Availability published February 3, 2020.

Comments on Clothianidin Registration Review Case 7620 Proposed Interim Decision and associated materials (EPA-HQ-OPP-2011-0865)

Dear Mr. Kahn:

Valent U.S.A. LLC and BASF welcome the opportunity to comment to the Proposed Interim Decision (PID) for Clothianidin. We support this proposed decision with slight modifications. The comments submitted here describe our primary concerns related to the PID and we respectfully request that EPA integrate these comments into the Final Interim Decision.

Should you need any follow up, please don't hesitate to reach out.

Sincerely,

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Valent U.S.A. LLC

Amy McCaskill
Registration Manager
BASF

Worker Exposure Assessment for Corn Seed Treatment

Comment on requirement for respirator for corn seed treatment workers performing multiple activities

The following comments are directed to EPA's requirement in the Proposed Interim Registration Review Decision (PID) for corn seed treatment workers performing multiple activities to wear a "PF5" respirator when treating seed with liquid formulations of clothianidin. The PID states "The MOE for occupational handlers performing multiple activities (loading/applying, sewing, bagging, *etc.*) for corn seed treatment is 71 with the currently label-required personal protective equipment (PPE) of single layer clothing (*i.e.,* long sleeves and pants) and gloves. With the addition of a respirator, the risk would no longer be of concern (MOE = 190)." We believe this assessment is overly conservative for a majority of corn seed that is treated in the United States and provide information in this comment that supports assigning different PPE requirements for workers treating different types of corn seed.

The risks to workers conducting different seed treatment activities were reported in the September 7, 2017 Human Health Risk Assessment in Support of Registration Review (D439294, in the clothianidin docket as EPA-HQ-OPP-2011-0865-0243). In this risk assessment, the dermal and inhalation risks to workers loading/applying, bagging, sewing and conducting multiple activities with diverse seed types with different formulations of clothianidin were all acceptable, with the exception of "corn" seed treatment workers conducting multiple activities. EPA calculated the clothianidin application rate for "corn" based on the seeds per pound from data developed by BEAD. EPA chose to use the most conservative high-end estimate of seeds per pound for popcorn and calculated the clothianidin application rate for use in the risk assessment as 0.014 lb ai/lb seed. This is based on the maximum label application rate of 1.25 mg clothianidin/seed for some types of corn. The following table summarizes the results of EPA's risk assessment for corn seed treatment workers performing multiple activities and shows the benefit to workers reducing the estimated risk to inhalation exposure by wearing a respirator.

Formulation	Crop or Target	Level of PPE	Maximum Application Rate[2] (lb ai/lb seed)	Pounds of Seed Treated or Planted Per Day[3]	Dermal (LOC=100)	Inhalation (LOC=100)	Total (LOC=100)
					MOE[4]	MOE[5]	MOE[6]
Multiple Activities							
Liquid	Corn	SL/G, No R	0.014	339,500	340	**89**	**71**
		SL/G, PF5R				440	190

In response to a public comment regarding a perceived error in the risk assessment process, EPA clarified HED policy regarding the use of BEAD data on seeds per pound for corn (D448343, in the clothianidin docket as EPA-HQ-OPP-2011-0865-1162). EPA indicated HED policy is to use the most conservative value for the number of seeds per pound as identified by BEAD when conducting the seed treatment worker risk assessment. In the 2011 BEAD document, the seed counts per pound of corn seed are presented in Table B-1 of the report. This table shows the seeds per pound for different types of corn seed as summarized below:

Crop Common Name	Seeds Per Pound
Corn (popcorn)	1,361 to 4,760
Corn (sweet corn)	1,800 to 4,500
Corn, field	1,361 to 2,000

Data from "Acres Planted per Day and Seeding Rates of Crops Grown in the United States" (Becker, J. and Ratnayake, S., 2011)

BEAD's summary for corn confirms the observation that dent (field) corn varieties generally have higher individual seed weights than popcorn or sweet corn varieties. The high-end value of seeds per pound for field corn is less than half of the high-end value for popcorn and sweet corn. When conducting the risk assessment for "corn", HED used the most conservative value of 4,760 seeds per pound for popcorn to represent all types of corn. We believe that this is overly conservative and leads to an unnecessary regulatory requirement for most of the corn seed that is treated commercially. Whereas the risk assessment is representative of HEDs process for evaluating the risk for workers treating popcorn seed, it is not representative of the risk for workers treating dent (field) corn seed which has a significantly higher individual seed weight.

Data available from the USDA demonstrate that a vast majority of the corn seed that is treated in the United States consists of dent (field) corn seeds. The amounts of different corn types that are treated provides additional support for segregating the risk for workers treating field corn from other corn types. Tables 1 and 2 provide a comparison of the areas of the different corn types planted or harvested in the US. Table 1 shows that planted dent corn acres have amounted to nearly 90 million acres for each of the last 3 years. Data on sweet corn planting, in contrast, shows less than 500 thousand acres for the last 3 years. The USDA NASS does not collect annual data on popcorn planting, but the Census of Agriculture, which is conducted every 5 years, contains data for the last three surveys. Table 2 shows for the last 3 data sets the harvested popcorn acres average about half of the planted sweet corn acres, and less than 0.25% of the dent corn acres.

Table 1. Acres planted in US for different types of corn

Type	2017	2018	2019	Average	Source
Dent (field) corn	90,167,000	89,129,000	91,700,000	90,332,000	A, B
Sweet corn (fresh and processed)	484,800	495,600	406,400	462,267	C

A USDA, NASS, Acreage report, Released June 29, 2018

B USDA, NASS, Acreage report, Released June 28, 2019

C USDA, NASS, Vegetables 2019 Summary, published February 2020

Table 2. Popcorn acres harvested in US

Type	2007	2012	2017	Average	Source
Popcorn	201,623	218,461	261,264	227,116	D

D USDA, NASS, Quick Stats Database, summaries from the Census of Agriculture, conducted every 5 years.

Dent (field) corn planted acres are about 195 times greater than the planted sweet corn acres and 398 times greater than the harvested popcorn acres. Therefore, the overwhelming majority of the corn seed treated by commercial seed treaters will be dent (field) corn varieties. Significantly lower quantities of sweet corn and popcorn seed are treated when compared with the quantities of field corn seed that are treated and planted (assuming the percentages of treated vs non-treated seed of the different corn types are similar).

Therefore, we believe it is more appropriate to regulate the risk for workers treating field corn seed separately from sweet corn and popcorn seed, considering the differences in the sizes of the seeds, as well as the significant differences in the quantities of seed that are treated in the United States.

Using the high-end seeds per pound from the 2011 BEAD survey, in tandem with the maximum clothianidin application rates for different corn seed types listed on product labels, we arrive at the application rates in Table 3. Note that the application rate calculated for popcorn (0.0131 lb ai/lb seed) is essentially the same as the value used by EPA in the 2017 risk assessment, whereas the application rates for sweet corn and field corn are significantly lower. The maximum label use rate of clothianidin for sweet corn is listed on product labels as 0.5 mg ai/seed, whereas the maximum rate for field corn and popcorn is 1.25 mg ai/seed.

Table 3. Calculation of application rate to different corn types based on high-end value of seeds per pound

Type	High-end Seeds per pound	Maximum Application Rate (mg ai/seed)	g ai/lb seed	lb ai/lb seed
Popcorn	4,760	1.25	5.95	0.0131
Sweet corn	4,500	0.50	2.25	0.0050
Field corn	2,000	1.25	2.50	0.0055

When the risk assessment for seed treatment workers conducting multiple activities is performed using the application rates for the different types of corn seed, the conclusions of the risk assessment vary significantly (Table 4). The risks to seed treatment workers performing multiple activities when treating and handling field corn and sweet corn are acceptable (MOE > 100) with a single layer of clothing, gloves, and no respiratory protection. However, when workers treat and handle popcorn seed, the inhalation risk is of concern for workers performing multiple activities (Total MOE = 75), but is not of concern if these workers wear an APF10 respirator (Total MOE = 205). The differences in the risk for workers treating and handling different types of corn seed justify requiring respiratory protection for only popcorn seed treatment workers performing multiple activities.

There are additional engineering controls that are available in commercial corn seed treatment facilities that can be used to mitigate inhalation exposures and replace the requirement for workers to wear a respirator. Closed transfer systems can be used when transferring liquid seed treatment formulations. In addition, at the bagging and packaging equipment air aspiration may be used as an alternative form of respiratory protection to reduce inhalation exposures. Mitigating inhalation exposures during these processes using available engineering controls would sufficiently reduce inhalation exposures for workers performing multiple activities such that they would not need to further reduce their inhalation exposure by wearing a respirator.

Based on the information provided in this comment we propose to work with EPA to establish appropriate label language to ensure additional protection where an inhalation risk of concern for workers treating and handling popcorn seed was identified. We propose to differentiate this from the risks that are not of concern for workers treating and handling sweet corn and dent (field) corn seed where the inhalation risk is acceptable without additional respiratory protection. We also propose to add an engineering control statement to labelling that would allow seed treatment facilities to use closed transfer systems and air aspiration equipment to reduce inhalation exposures so workers would not be required to wear a respirator.

Table 4. Occupational Handler Exposure and Risk Estimates for Clothianidin Commercial Field Corn, Sweet Corn and Popcorn Seed Treatment Workers Performing Multiple Activities

Formulation	Seed Type	Dermal Unit Exposure [1] (mg/lb ai) [Level of PPE]	Inhalation Unit Exposure [1] (mg/lb ai) [Level of PPE]	Maximum Application Rate [2] (lb ai/lb seed)	Pounds of Seed Treated or Planted Per Day [3]	Dermal (LOC=100) MOE [4]	Inhalation (LOC=100) MOE [5]	Total (LOC=100) MOE [6]
Liquid	Corn, field	0.042 [SL, G]	0.0016 [No R]	0.0055	339,500	862	226	179
Liquid	Corn, sweet	0.042 [SL, G]	0.0016 [No R]	0.0050	339,500	948	249	197
Liquid	Corn, pop	0.042 [SL, G]	0.0016 [No R]	0.0131	339,500	362	**95**	**75**
Liquid	Corn, pop	0.042 [SL, G]	0.00032 [PF10 R]	0.0131	339,500	362	475	205

1. Based on the Science Advisory Council for Exposure Policy 14 (May 2003); Level of mitigation: Baseline (Single layer, SL; Gloves, G; no respirator, No R). "PF10" respirator exposure calculated from available "no respirator" exposure data by dividing by 5. Note that EPA has recently changed the designation of PF10 respirators according to the NIOSH designation as an APF10 filtering facepiece respirator, which EPA previously referred to as a PF5 respirator.
2. Seed treatment rates as shown in Table 3.
3. Value from EPA Policy 15.2.
4. Dermal MOE = Dermal POD (9.8 mg/kg/day) ÷ Dermal Dose (mg/kg/day). Dermal Dose = Dermal Unit Exposure (mg/lb ai) × Application Rate (lb ai/lb of seed) × Amount Handled Daily (lb seed treated/day) × DAF (1%) ÷ BW (69 kg).
5. Inhalation MOE = Inhalation POD (9.8 mg/kg/day) ÷ Inhalation Dose (mg/kg/day). Inhalation Dose = Inhalation Unit Exposure (mg/lb ai) × Application Rate (lb ai/lb of seed) × Amount Handled Daily (lb seed treated/day) ÷ BW (69 kg). Bolded risk estimates are of concern.
6. Total MOE = 1÷ [(1 ÷ Dermal MOE) + (1 ÷ Inhalation MOE)]

Pollinator Assessment

Two of the most significant advancements that EPA made in the higher tier refinement methods of the pollinator risk assessment are converting pollen residues to nectar equivalents for comparison to colony feeding study results and in the derivation of acute and chronic 'residues of concern' using a distributional approach. Both changes provide reasonable improvements in conducting and interpreting higher tier pollinator assessments. The 'bee bread method' utilized in the preliminary assessment was overlying conservative and inconsistent with other aspects of the assessment. The use of a percentile from the distribution of residue trials, when sufficient numbers or studies are conducted, is consistent with other areas of environmental risk assessment (e.g., surface water modeling).

In attachment 4 of the neonicotinoid final bee risk assessment regarding the residue analysis of seed treatment uses, there are several studies that have been mischaracterized as indicated below.

MRID #49073613

Results from this study conducted in St. Symphorien d'Ancelles, France are used in the distributions for corn seed treatment residues. In Table 5, it is characterized as having four samples. However, only two samples were collected from the field in this study. These pollen samples were collected at two different dates. They were then combined into one composite sample which was analyzed four times. Based on the rejection rationale used for other studies, it seems likely that this study would not be used due to a lack of replicate samples taken in the field.

MRID #50025901 & #50025902

Text associated with Table 9 states "These data come from a study involving two different years of treatment at the same site in Brazil." These studies were conducted in the same Brazilian state, but not at the same field site. The field sites in these studies are approximately 40 km apart from each other as indicated by the GPS coordinates in the study reports. Also in table 9, for clothianidin samples, it indicates that 16 samples were collected from comb and 14 samples were collected from bees. In actuality, for each study, there was one sample collected from the pollen trap and the rest were collected from the comb.

These two studies were also singled out in the text in the following statements:

p. 32 "Given the low treatment rates associated with these studies relative to US rates …, there is uncertainty in using the nectar residue data to represent exposures relevant to these two chemicals." And p. 30 "Since the seed treatment rate used in this study (0.088 mg a.i./seed) is almost 2X lower than the maximum rate allowed on the label for clothianidin (0.13 mg a.i./seed), there is uncertainty regarding the relevance of these data to exposures to bees at the maximum rate."

These comments are inconsistent with the rest of this document. The rates in question are 1.5 fold different between those in the Brazilian studies and the US labeled rate. Studies with corn seed treatments had rates that varied by more than 2 fold and the thiamethoxam soybean residue studies also have varying rates (2 fold). It is unclear why this concern is only highlighted for these two clothianidin soybean residue studies.

In attachment 2 of the final bee risk assessment document a comprehensive analysis has been made aiming to generate sufficient residue data in order to evaluate the reliability of residue extrapolation (bridging) among chemicals and crops where data were lacking for foliar and soil applications. However, the methodology underlying the residue bridging approach present several limitations and uncertainties, so the risk conclusions derived from these should be taken with caution.

This reliance on residue extrapolation (bridging) data reflects one of the limitations of the approach taken, even before considering possible concerns with regards to the way exposure is estimated on this basis. The use of higher tier data (from cage and field studies) involves more realistic assessments of exposure that can be directly related to the conditions under which a study was conducted and so can be applied more generally. Consequently, the assessment is restricted to the use of unreliable worst-case exposure assessment with a considerable level of uncertainty.

One of the most important limitations in the reliance of the bridging is linked to the kinetic approach used. This was used when "sufficient" data was available and only SFO-derived k values were estimated. However, most of the trial-specific data sets for pollen and nectar contain few sampling events (less than 4) over the bloom, so the corresponding "k" estimates cannot be considered sufficiently reliable to drawing conclusions on degradation, or bridging for "k" across chemicals and crops. Moreover, the selection of a "r^2" value of 0.2 as criterion for "k" reliability screening is also questionable and brings uncertainty to the bridging analysis. The use of the coefficient of determination for model fit is not recommended for a standard kinetic assessment because the r^2 value is limited to linear relationships. Even if their limitations are considered, if the use of first order kinetics to calculate degradation rates results in a $r^2 < 0.7$, then other methods should be tested and used.

Using the bridging approach, a potential in-field risk for cucurbit crop group has been assumed although available measured data for clothianidin show safe use. Given the lack of reliance on residue extrapolation from other neonicotinoids data, we request to assess clothianidin use with clothianidin residue data only. It is worth noting that clothianidin product already have pre-bloom restrictions on labels (e.g., 59639-150), limiting application until BBCH 14: up to four true leaves unfolded on main stem.

While many different factors were analyzed for the purpose of the residue bridging analysis, one of the important factors that has not been analyzed is the use of outliers related to the poor quality of nectar or pollen samples. The sampling quality can also significantly influence residues in pollen and nectar across chemicals and crops. To reduce unrepresentative values in nectar and pollen data sets, several methodologies should be developed:

- Standardized test guideline for conducting field residue studies with a sufficient number of test sites that can reduce variability and prevent generating outliers. Analysis of the variability of the California studies (with nine sites) could reduce some of uncertainties/limitations found in the EPA analysis.

- A comprehensive guideline on how to collect bee relevant matrices can significantly reduce generations of outlier values caused by poor quality of collected nectar and pollen samples. Some crops have a complex flower structure and not having harmonized guidelines on how to collect bee relevant samples can lead to collecting nectar that contain significant amount of pollen or sampling pollen that is contaminated with plant tissues.

- Appropriate training of both field CRO and analytical laboratories personnel is essential in generating reliable data sets for evaluating exposure of chemical residues to bee.

Indeed, residue field data cannot eliminate completely site-to-site and year-to-year variabilities. However, having developed methodologies on how to collect samples and guidelines in conducting residue field studies will help prevent outliers related to the quality of pollen and nectar samples and allow for some consistency in generating robust residue data sets across chemicals and crops.

There are also a couple of studies related to foliar and soil application uses of clothianidin that we have comments on as indicated below.

Foliar applications

Cotton

It is noted that the bridging analysis was made using a use pattern which is no longer registered (i.e. for two application at 0.1 lb.ai/A instead of a single application at 0.083 lb.ai/A). Therefore, only the study MRID 49904901 should be used by EPA in the risk assessment.

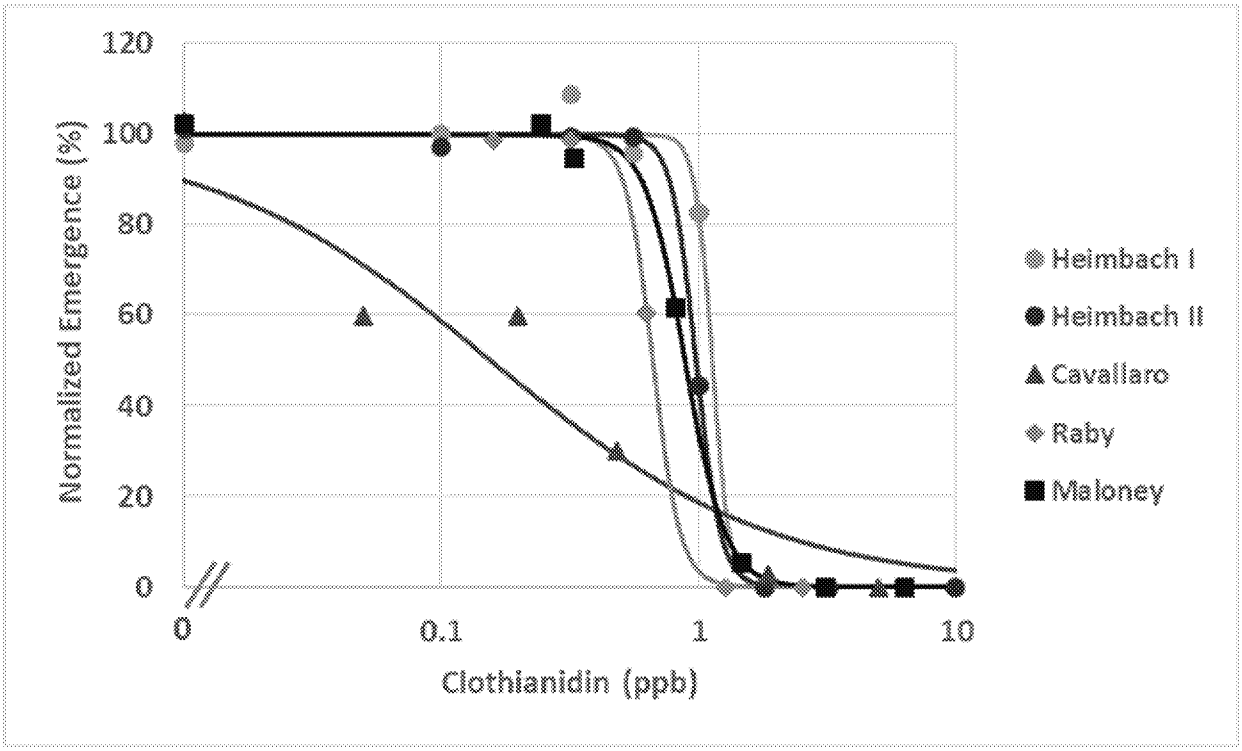
Soil applications

Crop group 9 – Cucurbits (pumpkin, squash, cucumber, melon)

In the case of pumpkins (MRID 49705901), it is reported that in cucumbers nectar residues were initially higher than for other species although this occurs at 37 DAA after initially lower values were obtained. However, it is also noted that given only a single day's measurements and the low replication for cucumber nectar samples it is unclear how typical the high measurements at 37 DAA are. This demonstrates the problem of including possible outliers in the data set.

Aquatic Assessment

There are five water-spiked clothianidin chronic studies with midges (*Chironomus* sp.). The concentration-response curves for emergence are shown in the figure below. It is remarkable how consistent four of these studies are, however, the study that the EPA used to set the chronic endpoint for clothianidin is the one that dramatically differs from the others.



The two Heimbach studies were conducted in 1999 and submitted by the clothianidin registrant. The Cavallaro study was published in 2017 and has a very different outcome. When two labs reach different results, in an ideal world, a third, independent lab would replicate the study. The Raby study, which was conducted at a government laboratory in Ontario, Canada was published in 2018, **with 3X the replication of the Cavallaro study**. The next question is: Can the lab whose results are not corroborated by the other labs replicate their first study? This question was answered in the study published by Maloney in 2018. The answer can be clearly seen in the figure above.

The replicability of experimental results is an essential element of the scientific method and the foundation of science. The EPA used the results from the Cavallaro study to set the aquatic invertebrate chronic level of concern in their preliminary aquatic assessment for clothianidin. Regardless of the inability of these results to be replicated by either an independent lab or the original lab from which these results originated; EPA decided to continue to rely on this study in their most recent clothianidin risk assessment. Further, EPA has set their Aquatic Life Benchmark for clothianidin based on this assessment with the benchmark coming from a study which has been shown to be non-replicable.

EFED has noted in their response that revising this level of concern is "unlikely to change" chronic risk conclusions. This may be the case; however, the use of this level of concern in their assessment has resulted in the setting of the Aquatic Life Benchmark at 0.05 ppb. This benchmark is used by various stakeholders, including state and foreign governments, in their decision-making processes. EPA should revise this benchmark in accordance with the best available science.